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BUL 29

Bulletin No. 29 February 25, 1922.

M. M. LEIGHTON

COMMONWEALTH OF PENNSYLVANIA

DEPARTMENT OF INTERNAL AFFAIRS
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GEOLOGIC STRUCTURE OF THE GREENSBURG QUADRANGLE, PENNA.

By

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The Greensburg quadrangle lies east of Pittsburgh in Westmoreland and Allegheny counties. It contains 227 square miles, and is 17¼ miles long and 13¾ miles wide. The village of New Texas is in the extreme northwest corner and Dick is in the southwest corner. Greensburg is situated about four miles northwest of the southeast corner of the quadrangle and Saltsburg is three miles east of the northeast corner.

The geologic examination of the area was made in the summer of 1921 by several members of the State Geological Survey. The results of this field work are being compiled by the writer and the following description of the geologic structure is published with the hope that it may be a guide in the further exploration for oil and gas.

The Greensburg quadrangle is traversed by three strong anticlines (up-folds) and three synclines (down-folds). These structural folds cross the quadrangle in a northeast direction in accordance with the general structure of western Pennsylvania. The synclines and anticlines become sharper and the folds are more pronounced from west to east.

The following description of the various structures treats of them in order from northwest to southeast.

Duquesne Syncline. This syncline, originating as a branch of the Pigeon Creek syncline, passes through Dravosburg and Duquesne, follows up Thompson Run and enters the Greensburg quadrangle three-fourths of a mile northeast of Trestle. It crosses the northwest corner of the Greensburg quadrangle as a broad shallow basin. The axis pursues a general northeast course between the village of New Texas and Plum Creek church.

Murrysville Anticline. Tremendous quantities of gas obtained from this anticline in the past have made it known to everyone in this region who is interested in the production of oil and gas. The supply of gas is by no means exhausted even now. The anticline passes through West Elizabeth, Clairton, Belle Bridge, and Versailles and enters the Greensburg quadrangle about one mile southeast of Trafford City station of the Pennsylvania Railroad. The axis passes about half a mile east of Murrysville (from which place the anticline gets its name) and continues in a northeasterly direction. The Murrysville anticline is strongly developed in the Greensburg quadrangle. It increases in elevation to the northeast and raises the Pittsburgh coal horizon (the coal has been eroded) from 1280 feet above sea level at the west boundary of the quadrangle to over 1800 feet at the north boundary.

Irwin (Port Royal) Syncline. The Port Royal syncline - known to bituminous coal operators as the Irwin basin - has its greatest development in the Greensburg quadrangle. The axis of this syncline passes one quarter of a mile west of Herminie, through Westmoreland City and Manor, half a mile west of Harrison City and one mile east of Export. The whole structure pitches to the southwest or in other words the bottom rises from south of Herminie where the Pittsburgh coal is well below the surface and is less than 600 feet above sea, to the vicinity of Export where its elevation is 950 feet. Northeast of Export the structure rises much more rapidly and the Irwin basin proper can be said to end three or four miles northeast of Export. Here the Pittsburgh coal crops out and in the saddle between the Irwin basin and the Elders Ridge syncline most of the coal has been eroded.

The Elders Ridge syncline, the south end of which is in the Greensburg quadrangle, is a continuation of the Irwin syncline as both lie between the Murrysville and the Grapeville anticlines. The Elders Ridge syncline has a low pitch to the northeast and the Pittsburgh coal sinks from an elevation of 1250 feet at the mouth of Porters Run to 1170 feet at the quadrangle boundary.

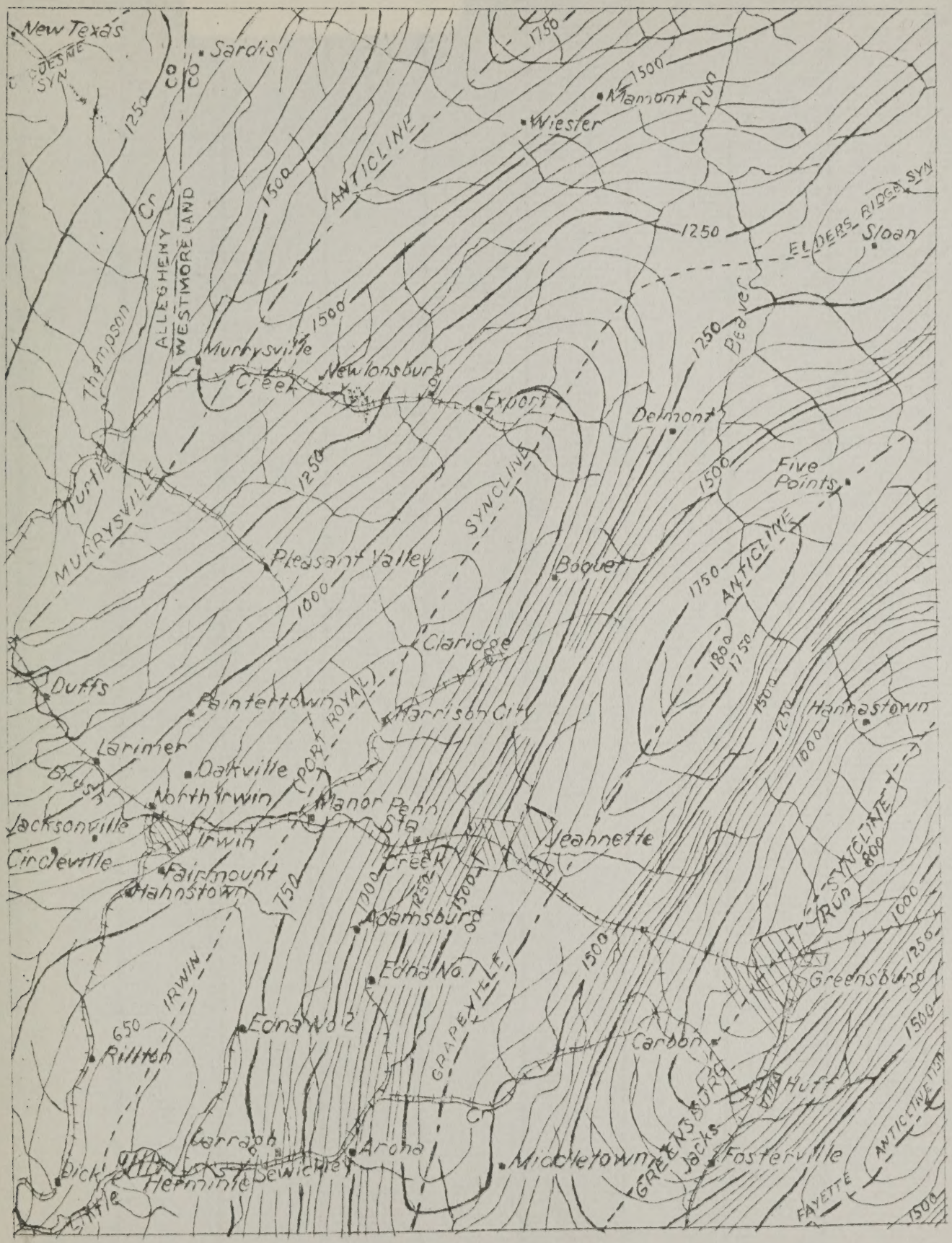
Grapeville Anticline. This structure also is well known to oil and gas men. It has produced tremendous quantities of gas in the past and still is a large producer. Part of the structure has not yet been tested by the drill. The south end of this anticline is just north of Walts Mill on Sewickley Creek. The crest rises rapidly and one mile southeast of Arona the horizon of the Pittsburgh coal is at an elevation of 1460 feet. From this point the axis extends northeast through Eisaman, swings more to the east and passes through Grapeville, cuts the main line of the Pennsylvania Railroad about one mile east of Jeannette station, inclines slightly more to the east and passes directly through the village of Five Points. The highest part of the anticline is a dome about three and one-half miles northeast of Jeannette. Here the horizon of the Pittsburgh coal is more than 1800 feet above sea level. Northward the elevation of the Pittsburgh coal horizon decreases 150 feet in four miles.

Greensburg Syncline. The Greensburg basin has long been known to coal operators as one of the four great coal basins of western Pennsylvania. The city of Greensburg is in the middle of the basin and owes its existence largely to the valuable Pittsburgh coal bed underneath it.

The south end of the Greensburg syncline is just east of the tip of the Grapeville anticline. The axis of the syncline crosses the Greensburg quadrangle in a northeast direction, passing through Swede Hill and the city of Greensburg, and leaving the quadrangle one mile east of Hannastown. At the bottom of the basin, two miles north of Greensburg, the Pittsburgh coal is 775 feet above sea level. East of Hannastown the coal has risen to 830 feet. Southwest of Greensburg the structure rises rapidly. The horizon of the coal - the coal has been eroded - along the axis of the syncline at the south boundary of the quadrangle is at an elevation of 1250 feet.

Fayette Anticline. The Fayette anticline, like the Duquesne syncline, crosses only a corner of the quadrangle. The axis of the anticline has a northeast-southwest trend and is close to the Hempfield-Unity township line. The anticline rises sharply from south to north.

The anticlines and synclines described above and shown on the accompanying map, constitute the major structural features of the quadrangle. There are many minor kinks and folds in the synclines and on the anticlines which are of local importance only. Some of these it is impossible to show on the structure sheet on account of the large contour interval which it was found necessary to use.



MAP OF GREENSBURG QUADRANGLE SHOWING GEOLOGIC STRUCTURE

Structure contours on horizon of Pittsburgh coal.

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